

# Fourth Annual Conference on Carbon Capture & Sequestration

*Developing Potential Paths Forward Based on the  
Knowledge, Science and Experience to Date*

*Geological Sequestration*

## CO<sub>2</sub> Capture Project – Phase 2: Breaking the technology mould

Gardiner Hill

May 2-5, 2005, Hilton Alexandria Mark Center, Alexandria Virginia



# CO<sub>2</sub> Capture Project – Phase 2: Breaking the technology mould

## Outline of talk

- CCP program outline
- CCP2 project objectives
- Who is involved?
- Project structure
- Technology program
  - Capture technology
  - SMV
  - Policy
  - Communications
- Breaking the technology mould
- Summary & concluding remarks

# CCP project outline

- Multi-phase program
  - Phase 1 – 2001-2004 completed
    - Identification/selection/initial development
  - Phase 2 – 2005-2007 just started
    - developing and refining technology performance
  - Phase 3 – 2008-2012
    - demonstration

# CCP2 project objectives

- Undertake additional research, development and pilot testing to reduce cost of CO<sub>2</sub> capture from large fixed sources
- Reduce technology and cost uncertainty associated with those technologies and deliver low-cost CO<sub>2</sub> capture technologies to demonstration stage by 2007
- Demonstrate that the geological storage of CO<sub>2</sub> is secure and can represent a viable Greenhouse Gas mitigation technique. Further develop technology, best practice and industry standards for storage site evaluation, risk assessment, well integrity, monitoring & verification
- Establish an extended network for CO<sub>2</sub> storage demonstrations to share learning and best practice

# CCP program goals

- International industry and government partners cooperatively direct and fund the development of CO<sub>2</sub> capture and storage technologies with the aim of advancing the science and expanding the potential scope of implementation
- Identify and develop technologies to reduce the costs of Capture of CO<sub>2</sub> emissions by 50-75% from the 2000 baseline
  - Achieve cost target of Capture & Storage to \$20-30 per ton of CO<sub>2</sub>
  - Include cost target in terms of \$ per KWHR power generated
- Reduce uncertainties associated with geological storage of CO<sub>2</sub>. Identify and address critical issues around assurance of geological storage. Contribute to global efforts to establish best practices for site characterization, process optimization, monitoring, verification and risk assessment
- Increase public awareness and acceptance of CCS
- Expand economic/ infrastructure scenarios for complete integration of the CO<sub>2</sub> capture, transportation and storage value chain

# Who is involved in CCP2?

## cooperating for a better environment



US Dept. of Energy  
National Energy Technology Laboratory  
*David Hyman, Program Manager*



EU DG Research

Directorate - General Research  
*Program Manager: Dennis O'Brien*



Norges forskningsråd

The Research Council of Norway  
*Program Manager: Hans -Roar Sørheim*



EU DG Energy and Transport

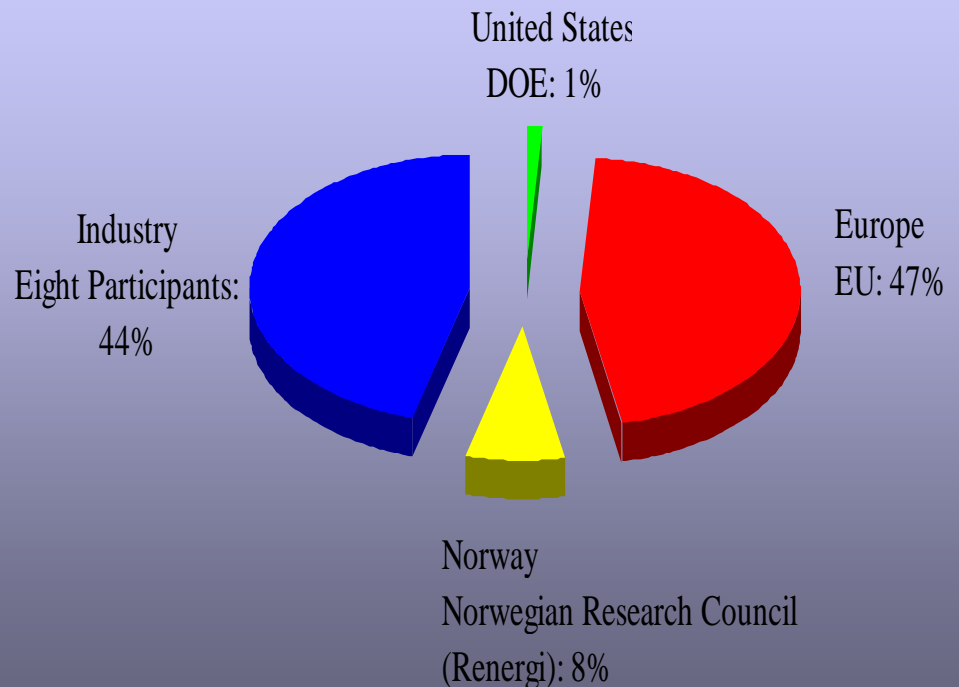
Directorate - General Energy and Transport  
*Program Manager: Vassilios Kougionas*

### Joint Industry Partnership (JIP)



# Project structure

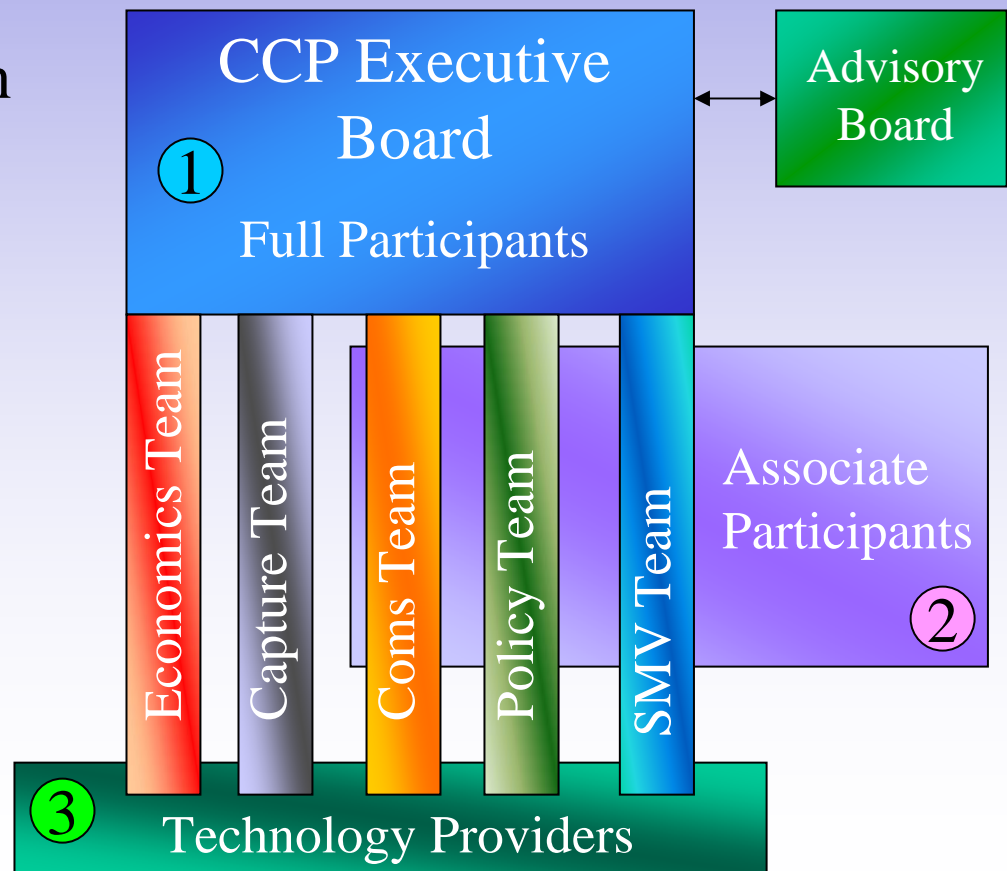
- International public-private collaboration
- Regional programs
- Sharing among programs to leverage results, reduce duplication
- \$14m Total Government Co-Funding (56%)
- \$25m Total Project Cost



# Project structure

Three ways to participate in CCP2;

1. As a Full participant
2. As an Associate participant
3. As a technology provider





# Technology program: Capture

Priority	Technology	Application
Near term	SEWGS	Pre
	BIT	Post
Mid term priority	Chemical Looping	Oxy Firing & Pre
Long term Priority	HMR	Pre
	Novel Technologies	Pre & Post
Others	Membranes	Pre
	Gasification	Pre & Post
	Advanced SMR	

# Technology program: SMV

- Establish long-term well bore integrity
- Develop cost-effective monitoring in wells (secondarily, shallow wells beneath potable water)
- Technical criteria and procedures for secure abandonment and transfer
- Participate in Geological storage field demos sharing SMV tools, experience and learning
- Organize an “SMV Forum Series” to communicate with and inform JIPs and others internationally

# Technology program: Policy

- Update survey of existing policies, regulations, and incentives that impact or benefit CO<sub>2</sub> capture, injection and storage in geologic formations
- Continue network monitoring function and share information about proposed regulations, policies, and incentives that can affect CCS. Identify potential opportunities to inform the debate on CCS
- Participate in international forums to discuss the formulations of policies and incentives in CCS technology
- Comment on significant proposed policies and incentives in CCS technology – developing key policy related messages in support of creating favorable conditions for technology and commercial development

# Technology program: Communications

- Coordinate CCP key messages from technology programs
- Coordinate international forums for outreach and engagement with industry, NGO's and opinion leaders
- Publish and produce project information in multimedia formats
- Communicate project status and updates
- Coordinate publication of project final results

# Breaking the technology mould

- Engage a wider group of participants
- Shopping the world for technology providers
- Stage-gate process for continuous high grading
- Integrating the capture and storage picture
- Technology development orientated at near-to-medium term application
- Engaging key stakeholders, governments and NGO's
- Independent advisory board consisting of world class experts
- Understanding how CCS technology can add additional value
- Enabling a new paradigm – Breaking the link between fossil fuel use and emissions of CO<sub>2</sub> – a serious option

## Summary & concluding remarks

- CCP2 has transitioned successfully from CCP1
- Capture technology development will reduce cost and uncertainty around performance
- SMV will focus on developing long term well integrity, monitoring and abandonment criteria
- Driving technology towards demonstration
- Making CCS technology cost competitive with other low or no carbon energy alternatives

The End

Questions?

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